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## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>7</sup> :  G01N 33/543, 33/551	A3	(11) International Publication Number: <b>WO 00/04389</b>  (43) International Publication Date: 27 January 2000 (27.01.00)
<p>(21) International Application Number: PCT/US99/15968</p> <p>(22) International Filing Date: 14 July 1999 (14.07.99)</p> <p>(30) Priority Data: 09/115,455 14 July 1998 (14.07.98) US</p> <p>(71) Applicant: ZYOMYX, INC. [US/US]; 3912 Trust Way, Hayward, CA 94545 (US).</p> <p>(72) Inventors: WAGNER, Peter; 2211 Village Court #7, Belmont, CA 94002 (US). NOCK, Steffen; 3629 Glenwood Avenue, Redwood City, CA 94062 (US). AULT-RICHE, Dana; 972 Cajon Way, Palo Alto, CA 94303 (US). ITIN, Christian; 315 Waverley Street #3, Menlo Park, CA 94025 (US).</p> <p>(74) Agents: CHOW, Y., Ping et al.; Heller Ehrman White &amp; McAuliffe, 525 University Avenue, Palo Alto, CA 94301-1900 (US).</p>	<p>(81) Designated States: AE, AL, AM, AT, AT (Utility model), AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, CZ (Utility model), DE, DE (Utility model), DK, DK (Utility model), EE, EE (Utility model), ES, FI, FI (Utility model), GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (Utility model), SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</p> <p>Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i></p> <p>(88) Date of publication of the international search report: 27 April 2000 (27.04.00)</p>	
<p>(54) Title: ARRAYS OF PROTEIN-CAPTURE AGENTS AND METHODS OF USE THEREOF</p> <p>(57) Abstract</p> <p>Arrays of protein-capture agents useful for the simultaneous detection of a plurality of proteins which are the expression products, or fragments thereof, of a cell or population of cells in an organism are provided. A variety of antibody arrays, in particular, are described. Methods of both making and using the arrays of protein-capture agents are also disclosed. The invention arrays are particularly useful for various proteomics applications including assessing patterns of protein expression and modification in cells.</p>		

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## INTERNATIONAL SEARCH REPORT

Internatic Application No  
PCT/US 99/15968

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 G01N33/543 G01N33/551

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 0 596 421 A (HOFFMANN LA ROCHE) 11 May 1994 (1994-05-11) claims column 6, line 52 -column 7, line 11 column 9, line 50 -column 10, line 39 ---	1-28, 30-45
P,X	WO 98 50773 A (UNIV MINNESOTA) 12 November 1998 (1998-11-12) claims 1,15-20 page 11, line 25 -page 13, line 32 --- -/--	1-28, 30-45

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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- "A" document defining the general state of the art which is not considered to be of particular relevance
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- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
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Date of the actual completion of the international search

25 November 1999

Date of mailing of the international search report

03. 03. 2000

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International Application No  
PCT/US 99/15968

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	WO 98 43086 A (KIMBERLY CLARK CO) 1 October 1998 (1998-10-01) claims 1,9,11-20,3 figures 1,7 page 10, line 12 -page 11, line 2 page 15, line 27 -page 16, line 17 page 19, line 4 - line 30 page 24, line 9 -page 25, line 23 ---	1-28, 30-45
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X	US 5 629 213 A (KORNGUTH STEVEN E ET AL) 13 May 1997 (1997-05-13) cited in the application	1-28, 30-45
Y	claims page 2, line 41 - line 51 figure 2 column 3, line 26 - line 39 ---	1-28, 30-45
Y	US 5 620 850 A (BAMDAD CYNTHIA C ET AL) 15 April 1997 (1997-04-15) cited in the application claims column 2, line 55 - line 67 column 5, line 52 -column 6, line 18 column 7, line 4 - line 29 ---	1-28, 30-45
Y	US 5 405 766 A (KALLURY KRISHNA M R ET AL) 11 April 1995 (1995-04-11) cited in the application claims column 7, line 22 - line 49 ---	1-28, 30-45
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# INTERNATIONAL SEARCH REPORT

Internatio Application No  
PCT/US 99/15968

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	<p>PATENT ABSTRACTS OF JAPAN vol. 015, no. 034 (C-0799), 28 January 1991 (1991-01-28) &amp; JP 02 272081 A (FUJI PHOTO FILM CO LTD), 6 November 1990 (1990-11-06) abstract</p> <p>-----</p>	<p>1-28, 30-45</p>

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## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US 99/15968

**Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)**

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
  
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

**Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)**

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
  
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
  
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
  
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-28, 30-45

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

## FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

## 1. Claims : 1-28, 30-45

Array of protein capture agents comprising a substrate, at least one organic thin film covering some or all of the substrate surface, a plurality of patches wherein each patch comprises protein capture agents immobilized on the organic thin film and capable of binding to a specific binding ligand or an array of protein capture agents immobilized on the organic thin film and capable of binding to a specific binding ligand, using said array in diagnostic methods.

## 1.1 :

Array of bound proteins comprising a substrate, at least one organic thin film covering some or all of the substrate surface, a plurality of patches wherein each patch comprises a different protein bound to a protein capture agent and immobilized on the organic thin film via said protein capture agent.

## 2. Claim : 29

Method of assaying in parallel a plurality of different proteins comprising delivering the sample to an array of spatially distinct patches of different protein capture agents and detecting binding to said patches.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 99/15968

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